

Armed Forces College of Medicine

AFCM



Pterygopalatine fossa

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INTENDED LEARNING OBJECTIVES (ILO)



By the end of this lecture the student will be able to:

1. List boundaries and contents of pterygoplatine fossa
2. Describe beginning , termination , course & branches of maxillary artery
3. Discuss tributaries, communications , drainage of pterygoid venous plexus and its clinical significance
4. Describe roots and branches of pterygoplatine and otic ganglia

Key features



Pterygopalatine Fossa

- walls
- Contents
- Communications

Maxillary artery

- Beginning
- Termination
- Division
- Branches

Pterygoid plexus

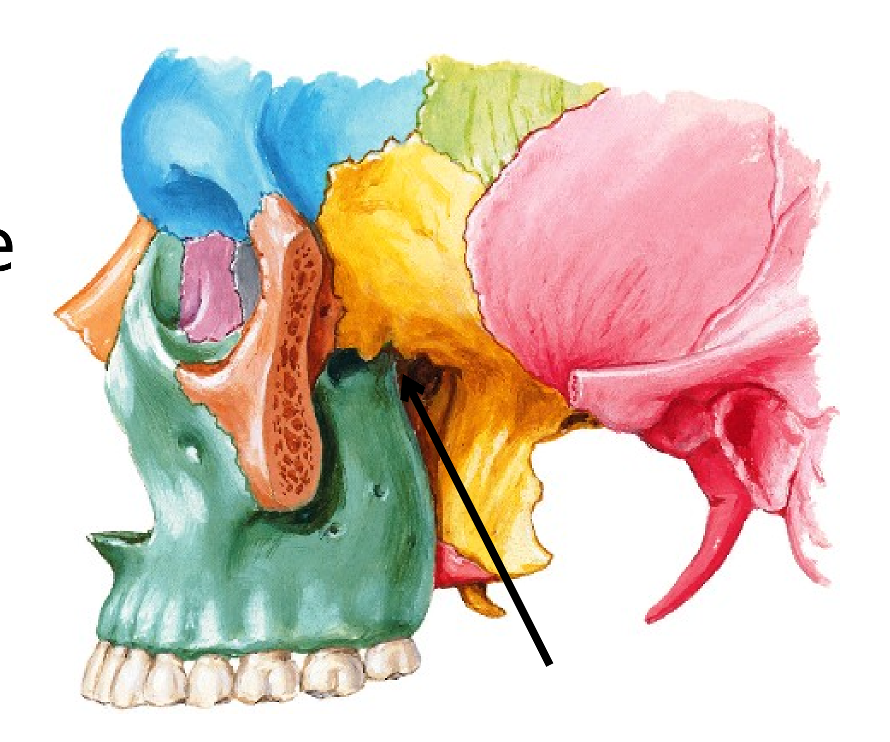
- Site
- Tributaries
- Drainage
- Communications

Pterygopalatine fossa



Definition

- Small inverted pyramidal space
- Medial to pterygo maxillary fissure

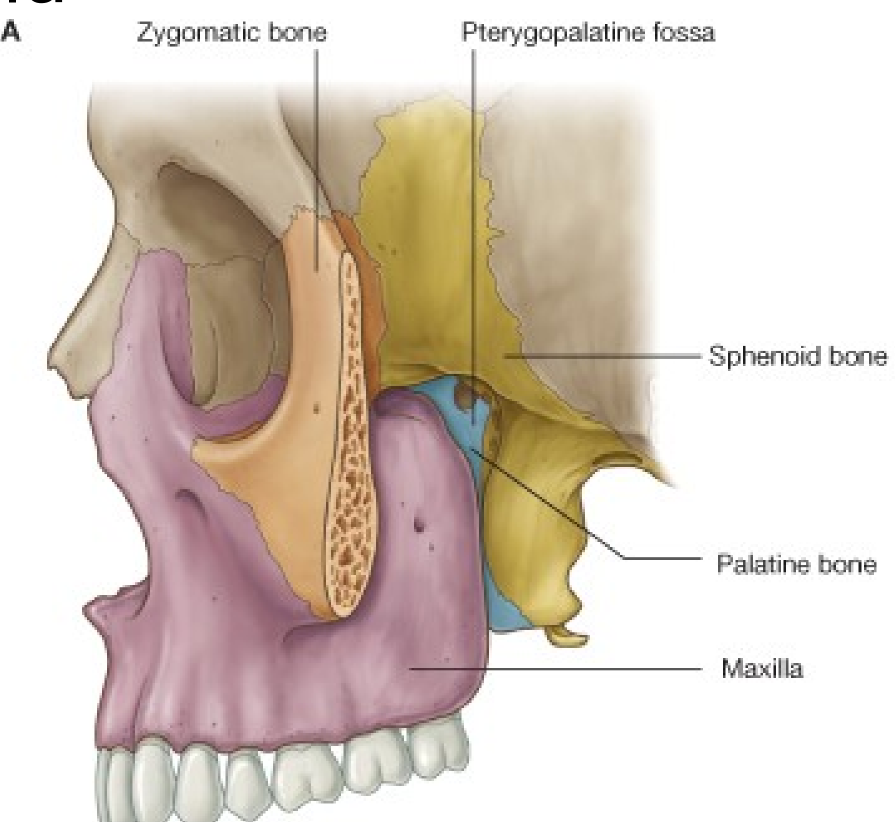


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Boundaries



<u>Anterior wall</u>: posterior wall of maxilla
<u>Posterior wall</u>: pterygoid process
<u>Medial wall</u>: vertical plate of palat
<u>Lateral</u>: pterygo maxillary fissure



Communications



Sphenopalatine foramen
nasal cavity

Inferior orbital fissure
floor of orbit

Pterygomaxillary fissure
infratemporal fossa

Palatovaginal canal
nasopharynx

Pterygoid canal
cranial cavity
(middle cranial fossa)

Foramen rotundum
cranial cavity
(middle cranial fossa)

Palatine canal
roof of oral cavity (palate)

Maxillary artery

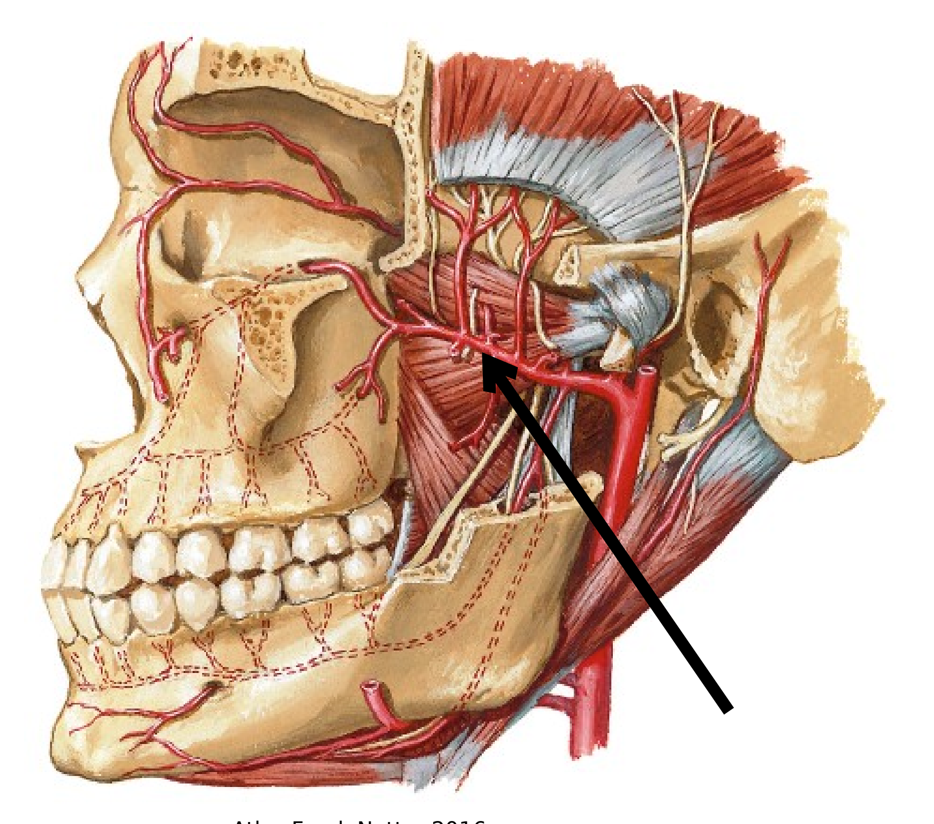


A terminal branch of external carotid
It begins at level of neck of mandible (medial side) inside parotid gland
It is divided into 3 parts by lateral pterygoid

First part:
runs horizontal between neck & sphenomandibular ligament till lower  **der of lateral pterygoid**

Second part:
runs upwards either superficial or deep to lateral surface of lateral pterygoid

Third part :
passes between 2 heads of lateral pterygoid to enter pterygopalatine fossa



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First part of maxillary artery



First part

Second part of maxillary artery



Sphenomandibular ligament

Third part of maxillary artery



Branches of first part of maxillary artery



<u>First part</u>

1. **Deep auricular** to external ear
2. **Anterior tympanic** to middle ear
3. **Middle meningeal** : enters skull via foramen spinosum related to pterion, rupture middle meningeal leads to extradural hematoma and contralateral hemiplegia
4. **Accessory meningeal**: enters skull via foramen ovale
5. **Inferior alveolar**: passes into mandibular foramen to supply lower teeth & gives mental artery , mylohyoid artery and incisive artery

First part



Inferior alveolar

Mental

Branches of first part of maxillary artery



Question:First part of maxillary artery



Maxillary artery begins at which of the following levels

A- head of mandible

B- neck of mandible

C- infratemporal fossa

D- lower border of lateral pterygoid

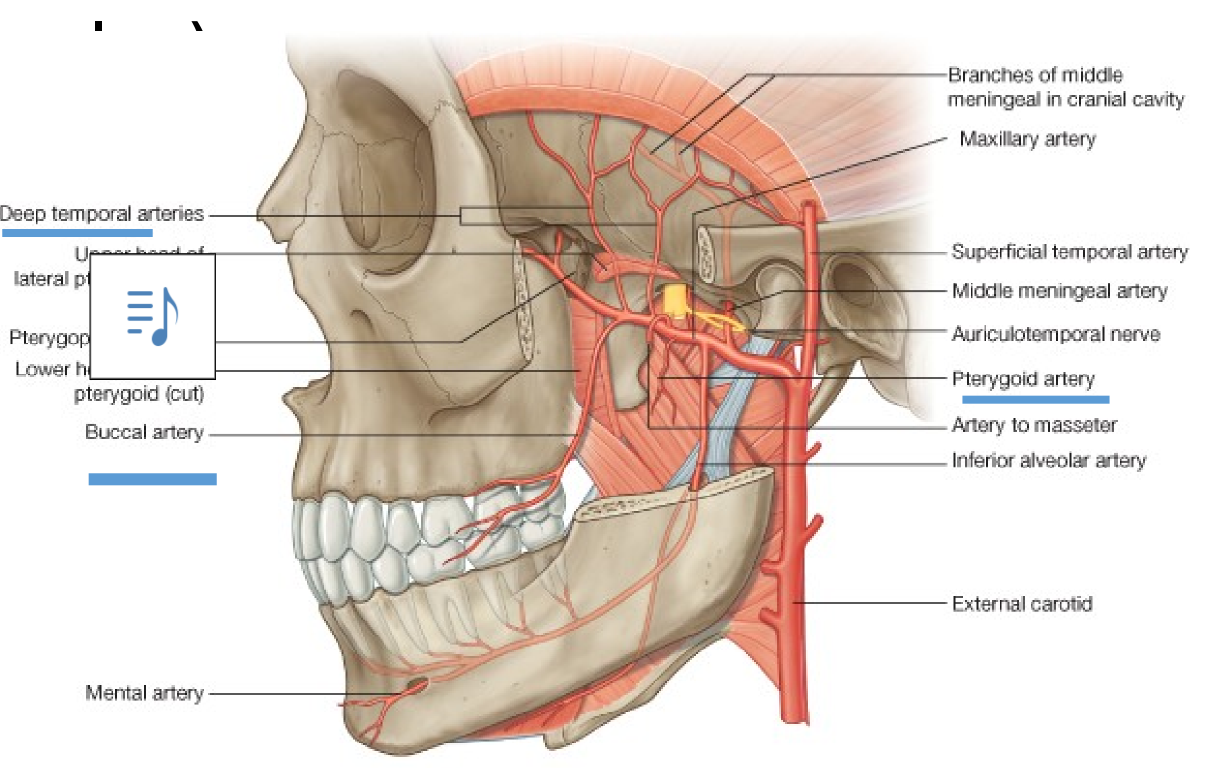
E- upper border of lateral pterygoid

Second part of maxillary artery



Second part (mainly mus

1. Deep temporal to tempc
2. Pterygoid to medial & la
 pterygoid
3. Masseteric: to masseter
4. Buccal:to buccinator



Second part of maxillary artery



Branches of second part of maxillary artery corresponds to which branches of mandibular nerve ??

Branches of third part



1. **Posterior superior alveolar**: to upper molars
2. **Infraorbital**: gives anterior superior alveolar. It passes via infraorbital fissure, groove & foramen (infraorbital artery)
3. **Greater & lesser palatine** to hard & soft palate
4. **Sphenopalatine**: to nose
5. **Pharyngeal** to nasopharynx
6. **Pterygoid artery**



Third part of maxillary artery



Which of the following is a branch of third part of maxillary artery?

a) Middle meningeal
b) Buccal
c) Deep auricular
d) Greaterpalatine
e) Inferior alveolar

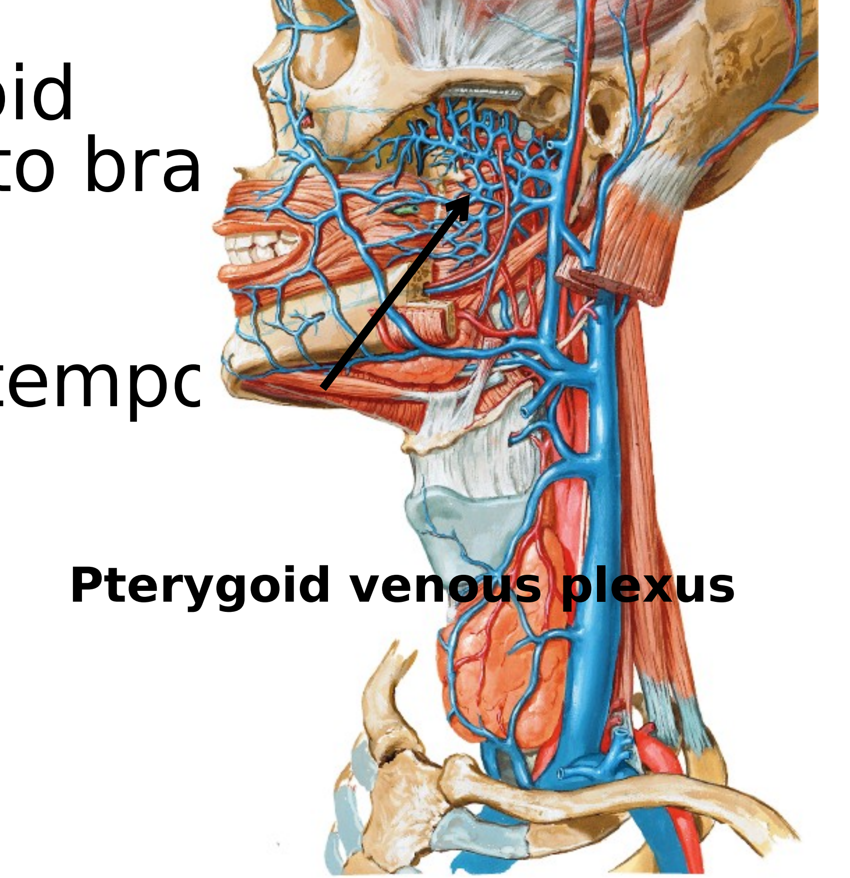
Pterygoid venous plexus



- ❑ Plexus of veins around lateral pterygoid
- ❑ It receives branches that correspond to bra of maxillary artery
- ❑ Drained by maxillary vein
- ❑ Maxillary vein unites with s[illegible]erficial tempo vein to form retromandibular vein

Communications

- ❖ With facial vein via deep facial vein
- ❖ Cavernous sinus via 3 emissary veins
- ❖ Inferior opthalmic vein



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Pterygoid venous plexus



Inferior ophthalmic vein

Emissary veins
(connect with cavernous sinus)

Superficial temporal vein

Maxillary vein

Deep facial vein

Inferior alveolar vein

Posterior auricular vein

Facial vein

Retromandibular vein

External jugular vein

Internal jugular vein

Pterygoid venous plexus



Pterygopalatine Ganglia



Ciliary ganglion

Ophthalmic nerve [V_1]

Oculomotor nerve [III]

Trigeminal nerve [V]

Facial nerve [VII]

Mandibular nerve [V_3]

V_2

Vagus nerve [X]

Pterygopalatine ganglion

Otic ganglion

Glossopharyngeal nerve [IX]

Submandibular ganglion

Pterygopalatine Ganglia



- **Sensory root**: maxillary nerve
- **Sympathetic root**: deep pterosal post ganglionic sympathetic fibers
- **Parasympathetic root**: superior salivatory nucleus -facial nerve - greater petrosal unite with deep petrosal to form nerve of pterygoid canal relay in ganglia
- Post ganglionic branches pass to nasal , palatine, pharyngeal glands

Some fibers pass in maxillary then zygomatic temporal join lacrimal nerve to reach lacrimal gland

Pterygopalatine Ganglia



Greater petrosal nerve (preganglionic parasympathetic and special sensory (taste))

Nasopalatine nerve

Nerve of pterygoid canal

Maxillary nerve

[V]

[VII]

Pterygopalatine ganglion

Palatine canal

eep petrosal nerve (postganglionic sympathetic)

Internal carotid artery

Superior cervical sympathetic ganglion

Lesser palatine nerve

Sympathetic trunk

Uvula

Nasopalatine nerve

Lesser palatine foramen

Preganglionic sympathetic from T1

Greater palatine nerve

Greater palatine foramen

Pterygopalatine Ganglia



Which of the following is the ganglia of common cold?

a) Otic
b) Submandibular
c) Pteryoplatine
d) Ciliary
e) Trigeminal

Otic ganglia



Sensory root: mandibular
Sympathetic: plexus around middle meningeal artery
Parasympathetic: inferior salivatory nucleus -tympanic branch of glossopharyngeal - tympanic plexus - lesser petrosal pass in foramen oval , relay in otic ganglia post ganglionic reaches parotid gland via auriculotemporal nerve

Otic ganglia



B

Tympanic plexus
Greater petrosal nerve
Facial nerve [VII]
Lesser petrosal nerve
Trigeminal nerve [V]
Ophthalmic nerve [V_1]
Maxillary nerve [V_2]
Chorda tympani
Mandibular nerve [V_3]
Otic ganglion
Glossopharyngeal nerve [IX]
Tympanic nerve
Auriculotemporal nerve
Lingual nerve
Inferior ganglion
Chorda tympani (carries taste from the anterior 2/3 of the tongue)
Tympanic membrane
Parotid gland
Chorda tympani carries parasympathetic innervation to all glands below the oral fissure
Submandibular ganglion
Submandibular gland
Sublingual gland

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Lecture Quiz





1. Pterygoid venous plexus is connected to facial vein via…… and to cavernous sinus via….
2. A branch of first part of maxillary artery that passes in mandibul[…] foramen……….



3. Which muscle divides maxillary artery ?
4. Pterygoid venous plexus is drained by………

A Branch of first part of maxillary artery

a) middle meningeal
b) Temporal

SUGGESTED TEXTBOOKS



1. Clinical anatomy by regions by Richard Snell

